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1. 4.2.1 4.3.1 Describe the types of intermolecular forces (attractions between molecules that have temporary dipoles, permanent dipoles or hydrogen bonding) and explain how they arise from the structural features of molecules. (3)
 - a. Describe the difference between intermolecular and intramolecular forces. Which is stronger? Provide some examples:
 - b. Describe Van der Waals' forces:
 - i. Provide a diagram:
 - ii. What is meant by stating that these forces are momentary or temporary?
 - iii. What factors affect Van der Waals' forces?
 1. Describe the effect of size on Van der Waals' forces:
 2. Describe the effect of Molecular Shape on Van der Waals' forces:
 - c. Describe the bonding in Graphite (both intermolecular and intramolecular).

c. Describe and illustrate dipole-dipole interactions:

i. between H-Cl molecules:

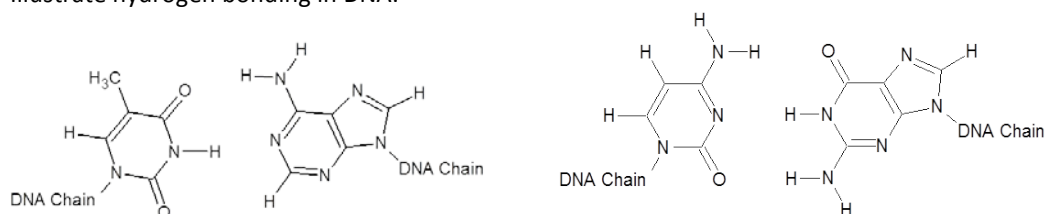
ii. between H-F molecules:

iii. What is different about the two above situations?

d. What is Hydrogen Bonding? Why is it considered to be a dipole-dipole type interaction?

i. Illustrate using ammonia (NH_3) and water (H_2O)

ii. Illustrate hydrogen bonding in DNA:



2. 4.3.2 Describe and explain how intermolecular forces affect the boiling points of substances. (3)

a. What does hydrogen bonding affect?

b. Describe the trend in boiling point of the hydrogen containing compounds of groups 4, 5, 6, and 7:

